



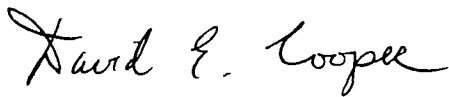
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

January 28, 2008

MEMORANDUM

SUBJECT: National Remedy Review Board Recommendations for the Gilt Edge Superfund Site Operable Unit 1

FROM: David E. Cooper, Chair
National Remedy Review Board 

TO: Carol Rushin, Associate Regional Administrator
Office of Ecosystems Protection and Restoration
U.S. EPA Region 8

Purpose

The National Remedy Review Board (the Board) has completed its review of the proposed cleanup action for the Gilt Edge Superfund Site Operable Unit 1 in Lawrence County, South Dakota. This memorandum documents the Board's advisory recommendations.

Context for Board Review

The Administrator announced the Board as one of the October 1995 Superfund Administrative Reforms to help control response costs and promote consistent and cost-effective decisions. The Board furthers these goals by providing a cross-regional, management-level, "real time" review of high cost proposed response actions prior to their being issued for public comment. The Board reviews all proposed cleanup actions that exceed its cost-based review criteria.

The Board evaluates the proposed actions for consistency with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and relevant Superfund policy and guidance. It focuses on the nature and complexity of the site; health and environmental risks; the range of alternatives that address site risks; the quality and reasonableness of the cost estimates for alternatives; regional, state/tribal, and other stakeholder opinions on the proposed actions; and any other relevant factors.

Generally, the Board makes advisory recommendations to the appropriate regional decision maker. The Region will then include these recommendations in the administrative record for the site, typically before it issues the proposed cleanup plan for public comment. While the Region is expected to give the board's recommendations substantial weight, other



important factors, such as subsequent public comment or technical analyses of response options, may influence the Region's final decision. The Board expects the regional decision maker to respond in writing to its recommendations within a reasonable period of time, noting in particular how the recommendations influenced the proposed cleanup decision, including any effect on the estimated cost of the action. It is important to remember that the Board does not change the Agency's current delegations or alter in any way the public's role in site decisions.

Overview of the Proposed Action

The Gilt Edge Superfund site is located in the mining district of the Black Hills of South Dakota. Mining for gold, copper, and tungsten, as well as mineral processing, was conducted at the site beginning in the late 1800s. This activity included a period of underground mining in the 1930s, and open pit mining and heap leach processing in the 1980s and 1990s. EPA has conducted numerous actions at the site including three interim records of decision to collect and treat acid rock drainage (ARD) (OU2) and to remediate the Ruby Gulch Waste Rock Dump (OU3). The action considered here for OU1 would address mine waste and would be complementary with the site water treatment remedy (OU2). The primary environmental source of contamination is the sulfide-containing rock that generates ARD, contaminating both surface and ground water. The Region is proposing to stabilize the site to reduce the potential for release of ARD, reduce the volume of ARD generated, and reduce exposure risk to recreational site users and wildlife.

NRRB Advisory Recommendations

The Board reviewed the information package describing this proposal and discussed related issues with remedial project manager Victor Ketellapper on December 6, 2007. Representatives from the South Dakota Department of Environment and Natural Resources Mark Laurensen, Mike Cepak, and Eric Holm participated by phone. Based on this review and discussion, the Board offers the following comments:

1. The package presented to the Board listed multiple preliminary remediation goals (PRGs), as well as multiple remedial action levels (RALs) for different human receptors (i.e. ATV riders, hikers, and future residents) and cancer risk targets. However, it was not clear what the selected cleanup levels in the preferred alternative would be for the site. The Board recommends that the Region clarify in the decision documents what cleanup levels will be selected for specific areas.
2. The package presented to the Board was not explicit with respect to human health and ecological risks and the effectiveness of the remedy in reducing these risks. The decision documents should explain how the proposed remedy reduces these risks. For example, at the meeting the Region described how the preferred remedy would reduce the threat of a catastrophic release of water contaminated with ARD. Such a release would adversely affect the surface water aquatic community, as well as pose a threat to ground water where the surface water reaches the "loss zone" and recharges aquifers used for residential and municipal water

supplies. This example of risk reduction and others should be described in the decision documents.

3. The preliminary remedial action objectives (RAOs) presented in the package do not appear to include a specific objective for restricting site uses to allow only low intensity recreational visitors or hikers and prevent residential uses or ATV rider use of the site. The package presented to the Board did present a RAO that stated that there would be controls such that “any disturbance follows best management practices and prescribed methods.” The Board recommends that the Region develop a more specific RAO that addresses the need for detailed institutional controls (ICs) to protect current and future human and ecological exposures.

4. The package presented to the Board appears to presume that soil cleanup levels do not need to be established for much of the site because areas that pose human health or ecological risk will be covered to reduce generation of ARD. The Board recommends that the Region consider whether all areas associated with human health risk will be covered under the alternatives, or whether some areas need to be covered to prevent direct contact exposure. Specifically, given that water treatment will continue, the Region should consider whether there are areas that could be covered with a simple soil cover to act as an exposure barrier and address direct contact risk rather than a cap to reduce or eliminate infiltration to prevent ARD generation, which could reduce costs without impacting protectiveness.

5. The package did not adequately describe the relative risk benefits associated with the various alternatives. For example, the present worth cost of Alternative 5 is nearly \$50M higher than Alternative 3, yet both appear to represent effective solutions and provide protective remedies. The Board recommends that the Region further evaluate the risk reductions associated with the alternatives and clearly explain the results of this analysis in the decision documents. The Board encourages the Region to consider this information and other factors, including cost, in identifying a preferred, cost effective, remedial alternative.

6. As presented to the Board, Alternatives 3 through 5 focus primarily on reducing the volume of ARD generation and subsequent contaminant loading in surface water coming from the site. These alternatives would accomplish this by removing, consolidating, and covering various amounts of waste rock, fill, and bedrock sources, along with treatment of ARD. The Region’s preferred alternative (5) is the most costly and also the most aggressive in terms of ARD reduction. According to the Region, one of the major benefits of the preferred alternative compared to Alternatives 3 and 4, which are less aggressive in reducing ARD, is it requires that less water to be treated, thereby reducing operation and maintenance (O&M) costs. However, the information package provided to the Board indicates the capital cost of Alternative 5 is about \$60M higher than Alternative 3, yet the total O&M cost is only about \$11M less. One might expect a greater difference in total O&M costs, because effective waste management (e.g., regrading, capping, subaqueous disposal, etc.) can reduce ARD generation and, consequently, contaminant loading in surface water bodies. The package indicated that construction of the Ruby Repository resulted in more than an 80% reduction in sulfate generation. The Board recommends that the Region further evaluate the O&M cost for Alternatives 3, 4, and 5 to determine whether they actually reflect expected conditions.

As part of this evaluation, the Board recommends that the Region more clearly identify both the ARD volume and metals loading reductions from each element of each alternative. These reductions should then be clearly tied to meeting specific RAOs. Calculation of a cost per unit of ARD volume or metals loading reduction would be useful in evaluating the relative benefits and cost-effectiveness of each alternative.

The Board recommends that the Region consider utilizing a phased approach to the remedy, with management of the most highly ARD generating materials being dealt with first. For example, addressing the “Lower Zone of Heap Leach Pad Spent Ore” could be a first priority; it is a relatively small volume of material but is identified as the strongest generator of ARD (see Table 4-1 of package presented to the Board). It may be possible to meet RAOs for the site without consolidating/capping all of the materials envisioned for such action in the preferred alternative.

The Board recommends that the Region consider expected changes in both ARD volume and contaminant loads when selecting an alternative that best balances costs for near-term waste management versus costs for long-term water treatment and the total cost of the remedy. The Board does not believe that the cost estimates provided by the Region support selection of the higher cost alternative. Further, the Board recommends that the Region review the scope of the interim ground water treatment ROD (OU2) to determine the extent to which the O&M cost for ARD are already covered by an existing decision document.

7. The remedies proposed by the Region include covering/capping of ARD generating rock with the borrow material and vegetative covers. The Region should consider the risks posed to ecological receptors in evaluating the remedy effectiveness of this approach. In particular, the capping material, depth of material, and/or the use of liners should be evaluated in terms of the desired root depth of the vegetative cover and sustained risk reduction. For example, cap thickness and material can provide a good substrate for vegetation so that vegetation will prevent erosion of cap material. The rooting depth requirements of native species, water requirements, and the depth of winter freezing should be considered in the design of any cap.

8. The package presented to the Board did not provide detailed information on the design of the cover systems proposed for the preferred alternative. The Region should evaluate potential cost savings in the design of the cover systems and take into consideration the amount of soil placement over the geosynthetic liner that could result in cost savings by reducing the amount of soil that would need to be imported from off site sources while still meeting RAOs.

9. The package presented to the Board indicated that the preferred alternative would use an area for dewatering and disposal of sludge from the ARD treatment. The Region should evaluate sludge handling and disposal practices as they may impact risks to ecological or human receptors that are exposed to the sludge. The Region should discuss in its decision documents how the sludge disposal cell would be constructed to protect against runoff, run-on, and leaching, and what if any, applicable or relevant and appropriate requirements apply to the generated sludge disposal.

10. The Board recommends that disposal of sludge in subsurface mine workings or into one of the open pits be evaluated as part of a remedial alternative. This method of sludge disposal could potentially reduce costs and could have the potential benefit of placing alkalinity in a location where it could provide further buffering of acidic water.

11. The Board recommends that the Region favor remedial alternatives that do not require pumping of ground water to control hydraulic head as a component, or at least minimize any pumping of ground water, to maintain constant ground water levels in the filled pit. ARD generating material should be placed either above the anticipated high water table or in an anaerobic zone below the water surface to avoid ARD generation. Pumping can be a significant O&M expense.

12. The package presented to the Board and the Region's presentation indicated that ARD moving off site will be captured and stored in the Anchor Hill Pit prior to treatment. The Board recognizes the need to use the pit for storage; however, the hydraulic connection between the Anchor Hill Pit and the ground water system has not been fully characterized or quantified (particularly the potential for preferential flow along fracture zones). The Board recommends that the Region further investigate this issue in order to better understand and minimize the risk of subsurface releases of ARD and contaminants from the Anchor Hill Pit.

13. The Board notes that gold mining operations caused the releases of hazardous substances that make this remedial action necessary. A mineral gold ore deposit remains in a parcel in the northwest area of the site, which is owned by the U.S. Forest Service. Future mining may create future waste generation and releases; and, if not prohibited, at a minimum it should be properly planned, managed, and controlled. The Board recommends that the Region work with the Forest Service to restrict or prohibit future mining activities at this portion of the site (e.g., withdrawal of the site from potential mining claims). The Region should consider coordinating with the Justice Department and the Forest Service to add the Forest Service as a party to the contemplated settlement or consent decree (along with the state and potentially responsible parties) to ensure the long-term integrity of the cleanup.

The Board appreciates the Region's efforts in working together with the potentially responsible parties, State, and community groups at this site. We request that a draft response to these findings be included with the draft Proposed Plan when it is forwarded to your OSRTI Regional Support Branch for review. The Regional Support Branch will work with both your staff and me to resolve any remaining issues prior to your release of the Proposed Plan. Once your response is final and made part of the site's Administrative Record, then a copy of this letter and your response will be posted on the Board website (<http://www.epa.gov/superfund/programs/nrrb/>).

Thank you for your support and the support of your managers and staff in preparing for this review. Please call me at (703) 603-8763 should you have any questions.

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